

**STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING SESSION – DIVISION OF DRINKING WATER
MARCH 21, 2023**

ITEM 5

SUBJECT

PROPOSED NOTIFICATION AND RESPONSE LEVELS FOR MANGANESE.

DISCUSSION

Manganese is an essential nutrient and enzyme cofactor that is naturally present in many foods and available as a dietary supplement. Despite its nutritional benefits, adverse health effects can be caused by over-exposure. Substantial evidence demonstrates that exposure to manganese at high levels can pose a neurotoxic risk.

Health and Safety Code (HSC) section 116455 describes notification levels as nonregulatory, health-based advisory levels established as precautionary measures for contaminants that may be candidates for maximum contaminant levels, but have not yet completed the regulatory standard setting process and are not drinking water standards. Response levels are established in conjunction with notification levels and represent the drinking water contaminant concentration at which additional steps—beyond notification—are recommended to reduce public exposure. Both notification and response levels are issued by the Division of Drinking Water (DDW) Deputy Director.

Manganese notification and response levels are currently set at 500 µg/L and 5,000 µg/L, respectively, based on neurotoxicity. Manganese also has a secondary maximum contaminant level (MCL) of 50 µg/L, based on aesthetic concerns.

HSC section 116455 requires public water systems to notify the governing body of the local agency governing the area in which the drinking water consumers reside (e.g., city council, county board of supervisors) when a maximum contaminant level or notification level is exceeded.

HSC section 116456 requires public notice, including specific information about the studies relied upon, and an informational item at a State Water Board meeting when establishing or revising notification and response levels.

DDW scientific staff conducted a literature search for human and animal research that studied adverse health effects from manganese exposures specifically by route of ingestion. Based on that research, DDW staff derived a health protective concentration (HPC) of 20 µg/L; the toxicological endpoint was reduced dopamine receptor protein levels in rats.

In response to DDW's request, on May 3, 2022, the Office of Environmental Health Hazard Assessment (OEHHA) provided their review of the DDW technical memorandum. The OEHHA comments supported the candidate study selection and the intermediate approach used to derive the HPC.

Following receipt and review of OEHHA's analysis and recommendation, DDW is proposing manganese notification and response levels of 20 µg/L and 200 µg/L, respectively. For this non-cancer toxicological endpoint, the response level is proposed at 10 times the notification level. DDW is proposing revised notification and response levels based on the potential risk for manganese-induced neurotoxicological effects to bottle-fed infants.

Because manganese may adversely affect infant and/or child development, DDW recommends that a field duplicate be collected as a potential sample confirmation (at the time of the original sample collection).

When a manganese water quality result in excess of the response level occurs, DDW recommends that the laboratory notify the supplier within 48 hours of receiving the result, and analyze the field duplicate or collect and analyze a confirmation sample.

- A. If the average of the two manganese sample results (original sample result and the subsequent sample result) exceeds the RL, report the result to the State Water Board within 48 hours. If the average does not exceed the RL, inform the State Water Board of the results within seven days from the receipt of the original analytical result.
- B. If a system is unable to resample within 48 hours, it should issue a public notice to the consumers in order to avoid exposures to young children and should collect and analyze a confirmation sample within two weeks of notification of the results of the first sample.

On February 16, 2023, public water systems and subscribers of the Drinking Water Announcements Lyris list were provided notice of the proposed revised manganese notification and response levels and availability of supporting documentation at https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/NotificationLevels.html

POLICY ISSUE

None.

FISCAL IMPACT

No fiscal impact.

REGIONAL BOARD IMPACT

None.

STAFF RECOMMENDATION

No action needed – informational item.